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AUTHOR Grube, Karl W.
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ABSTRACT

Three papers, each with an extensive bibliography, advance arguments concerning (1) the school site as a public land resource, (2) school board policy as related to economic alternatives for open space school site planning, and (3) the establishment of outdoor classrooms on school sites as public policy. In the first paper, the author contends that school officials should develop and implement comprehensive public land use policies applicable to the enhancement of the public school site, public policies that could insure the environmental quality of community-owned school sites and a land resource rightfully belonging to future generations. In the second paper, the author states that solutions to environmental problems of land development and utilization could and should be formulated by elected public officials such as school board members, with the land size of the public school site, its degree of development, and the natural and man made amenities contributing significantly to the formation of citizen attitudes. In the third paper, the author argues that learning opportunities for K-12 pupils could best be accomplished through the design, development, and implementation of an outdoor classroom on the school site. He offers an outdoor classroom public site policy to school officials as a model for implementation, in part, of a State masterplan for environmental education for elementary and secondary education. (Author/MLF)

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THE UNIVERSITY OF MICHIGAN

School of Education
Corner East and South University Avenues
Ann Arbor, Michigan 48104

SCHOOL SITE DECISIONS AND DOLLARS

The School Site As A Public Land Resource

School Board Policy As Related To Economic Alternatives For Open Space School Site Planning

The Establishment Of Outdoor Classrooms On School Sites As Public Policy

Dr. Karl W. Grube

Lecturer, School of Education,
The University of Michigan,
Ann Arbor, Michigan 48104

and

Lecturer, School of Education,
Eastern Michigan University
Ypsilanti, Michigan 48197

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America's population is confronted with an increasing number of complex environmental problems which threatens the existing quality of life. As this nation approaches the midpoint of the 1970's, the problems of counteracting urban blight, mismangement of land and other natural resources will require a national commitment to realize lasting solutions. Within the span of the next three decades, the American citizenry must become aware of these problems and be willing to effectively change what appears as a movement toward environmental disaster.

The past fifty years, especially the era of the 1960's, has produced two notable land use trends applicable to the land surrounding our great cities. A once prominent rural population continues to migrate to metropolitan areas, which places increased pressures upon the capacity of the land to support a quality level of living for its inhabitants. Our metropolitan regions continue to sprawl into the countryside in a haphazard manner with the result that land values throughout the nation are rising five to ten

per cent annually and the cost of lands suitable for public recreation is rising even faster.[1] According to the eminent landscape architect, John Ormsbee Simonds:

> The city of Toronto, for example, is surging northward for no apparent reason, into an area seven miles from its harbor on Lake Ontario. Aside from the convenience and more favorable topography of the lakeshore, which has ample room for expansion, the summer temperature at the lake is often 26 degrees cooler and the winter temperature 30 degrees warmer than at the areas of new building concentration.[2]

The phenomenon of urban sprawl is not only a major environmental problem for America, but seems to invade all human habitation, regardless of immense territorial space or nationhood.

The increasing rate of urbanization of our countryside is concentrating a greater percentage of the nation's population in the fringe areas of suburban regions. According to The President's Council on Recreation and Natural Beauty:

> For more than seven out of ten Americans, home is an urban setting - not only the place of residence, but the site of most experience. By the year 2000 - a mere 32 years away -

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[1]U.S. Department of Interior Yearbook No. 4, Man . . . An Endangered Species? (Washington, D.C.: U.S. Government Printing Office, 1968), p. 20.

[2]John Ormsbee Simonds, Landscape Architecture An Ecological Approach to Environmental Planning (New York: McGraw-Hill Book Company, 1961), p. 27.

> nearly nine out of ten Americans will dwell in urban areas.[1]

This projected growth in population and the explosive quality of concentrated countryside urbanization are significant elements in the competition for land use.

The development of new suburban communities on the fringe of America's cities has actually limited the amount of open space available for human usage. In a publication entitled "Land-Rich or Poor Schools," Dwayne E. Gardner stated:

> As suburbs sprawl across the land and cities stretch up to capture the sky, the people, the inhabitants, have less and less room to sprawl and stretch. By 1975, we will need over two million homes a year. We will need schools for more than ten million additional children, welfare and health facilities for five million people over the age of 60. But the accelerated demand for homes, shopping centers, highways, and public facilities leaves less open space in the suburbs and produces progressive decay in the cities.[2]

Instead of developing planned communities which meet the increased leisure demands for open space, urban sprawl development has had the reverse effect.

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[1] President's Council on Recreation and Natural Beauty, From Sea to Shining Sea (Washington, D.C.: Government Printing Office, 1968), p. 29.

[2] Dwayne E. Gardner, "Land-Rich or Poor Schools," American Education, III (November, 1967), 13.

School Site Influences On Neighborhood Environment

In considering the quality factors which comprise an environment which is satisfying to man, logic indicates that one must identify and examine the elements which compose this environment. Of major importance to many Americans is the residential neighborhood of their youth which provided the medium for environmental experience. Most adults can recall quite vividly the neighborhoods in which their childhood years were spent; these experiences provide a deep emotional impact on their present family structure. In discussing the elements of an environment which are meaningful to individuals, The President's Council on Recreation and Natural Beauty indicated:

> These formative experiences are inevitably enhanced and enriched in attractive, well-ordered neighborhoods; they are demeaned in districts of blight, litter, and ugliness, whether in decaying, crime-infested slums of the central city or in dreary sprawling suburbs on the outer urban fringes, the slums of the future.[1]

Historically, a focal point of many well-established neighborhoods was the public school site. It was the public school and its site which provided a common facility and land resource for potentially satisfying environmental ex-

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[1]President's Council, Shining Sea, p. 31.

periences. On the other hand, most public school systems in America have given little or no consideration to the ways in which the school site, the only common land which children and youth have in a neighborhood, could be used to enhance the environmental quality of neighborhoods. The public school site, this land which constitutes the commons for socialization of youth as well as adults, has been located to service a residential population with a limited, requisite amount of public or private transportation. Many residential neighborhoods do not have public land such as parkland space set aside for use; however, the public school site is available in all residential neighborhoods.

Open space school sites can contribute to the market sale price appreciation of residential housing, and the total property tax base of the public school district can be expanded. Expansion of the property tax base allows for the collection of incremental property tax revenues which can be utilized for improving limited space school sites. Other governmental units which rely on the property tax as a means for financing public services, i.e., city and county governments, can also benefit by the collection and accumulation of additional property tax revenues associated with open space school site neighborhoods.

Accordingly, the expansion of the property tax base can be attributed to positive economic influences of open space school sites on the appreciation rates of surrounding residential housing. The homeowner, a property taxpayer and voter, will gain a personal economic advantage. The psychological feelings associated with this personal economic advantage may contribute to a more favorable voting attitude regarding public school issues. In a study conducted by Edward C. Banfield and James Q. Wilson, the voting attitudes of various income voters in seven United States' cities were examined regarding public referenda proposals between 1957 and 1963. In the words of Banfield and Wilson:

> The voter tried to maximize his family income or (the same thing) self-interest narrowly conceived. We assume that the voter estimates in dollars both the benefits that will accrue to him and his family if the proposed public expenditure is made and the amount of the tax that will fall on him in consequence of the expenditure; if it is less, he votes against it.[1]

If the residential homeowner perceives that expenditures for public education, especially capital outlay for buildings and sites, are capitalized through higher market prices being paid for residential housing associated with

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[1]Edward C. Banfield and James Q. Wilson, "Voting Behavior on Municipal Public Expenditures: A Study in Rationality and Self-Interest," in The Public Economy of Urban Communities, ed. by Julius Margolis (Washington D.C.: Resources for the Future, 1965), p. 74.

open space school sites; perhaps his political voting attitude toward public school issues will be favorably affected.

Of prime importance is the defining of the quality factors of a school site which contributes to the total environmental quality of a neighborhood. These quality factors such as site size, educational, community, and landscape development of school sites are related to the economic value of neighborhood residential housing. Open space school sites do indeed improve the total environmental quality of a neighborhood, and it behooves educators to develop systems for financing these projects. In a publication for the Association of School Business Officials of the United States and Canada, Donald A. Jones alluded to the contemporary purpose of public school sites:

> In my opinion a large, roomy site is of prime importance. Fifty years ago our children were going to school in a different world. They could roam freely in the adult community with comparative safety. Today the thoroughfares of our urban world are crowded with metal monsters traveling at death dealing speeds, electric wires are overhead, gas is piped underfoot, and the "sand lots" or "commons" are gone. The world we have constructed has left few areas of safety where our children can freely move and explore in a relaxed atmosphere. Hence, if our children of today and tommorow are to have freedom of movement it must be in an area planned for the purpose and reserved for the children's use.[1]

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[1]Donald A. Jones, "School Site Selection: Methods, Policies, and Procedures in Acquisition and Purchase," Journal of the Association of Business Officials of the United States and Canada, LVI (1956), 75.

Public school sites located in residential neighborhoods can function as a fundamental network in establishing a system of open space areas for the use of neighborhood residents. In order for open space preserves to be established, boards of education must either acquire additional land, restructure school site policies to include significant site development expenditures and/or develop programs which are designed to serve all of the residents of a neighborhood.

Of the total expenditures in 1972 for public elementary and secondary education in the United States, 54.2 per cent was provided from local property tax revenues.[1] Municipalities also collect local property taxes on these same properties so that in 1970 municipalities received 84.9 per cent of their tax revenues from local property taxes.[2] The additional property tax revenue collected by the expansion of the property tax base for both school districts and municipalities is sufficient to provide the necessary funds for upgrading of limited space school sites to open space standards.

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[1] U. S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States 1972 (Washington D.C.: Government Printing Office, 1972), p. 106.

[2] Ibid., p. 409

Environmental Quality And The School Site

An immediate need exists for our American system to develop and maintain a planned, systematic approach to improving environmental quality for all citizens, especially the unborn generations which constitute our posterity. A planned approach to improving America's environment can be expressed and delineated in an economic rationale.

The requirements of modern living for roads, housing, water, power, factories, office space, and schoolhouses will continue to exert significant pressure upon the ability of economy to respond adequately to these demands. Further, the anticipated growth in population will create additional burdens upon the American system to adequately plan and to finance the growth demands of increased population. In an article entitled "Buying the Future," Howard Flieger remarked:

> By 1980 U. S. population will have increased by 14 million people to a total of 224 million. In an era when talk of trillions is humdrum, 14 million doesn't sound like much. But it means that the equivalent of a new town of 38,000 people must be opened up every week from now until mid-1980.[1]

The projected growth in population and the explosive quality of concentrated urbanization will be significant

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[1]Howard Flieger, "Buying the Future," U.S. News & World Report, May 28, 1973, p. 108.

elements in the competition for land use. Certain evidence indicates that increased competition is already reflected in data related to land use trends. According to a study of the Citizens Committee for the Outdoor Resources Review Commission:

> Three centuries of settlement and population expansion have appreciably changed the American landscape. Cities and roads have been built and expanded at the expense of forests and agricultural land. Today, about 2-1/2 per cent of our land area represents cities, roads and airports. Parks and similar regulated open areas represent about 3-1/2 per cent. Crops cover 20 per cent. Wild land is being used up alarmingly fast. As cities become crowded, there is a spillout of people to new urbanized corridors, subdivisions, and existing towns and villages. Each year a million acres of land are developed in one way or another.[1]

Representing a portion of the increased land consumption in our countryside is the significant market demand for open space devoted to recreation. In summarizing a Bureau of Outdoor Recreation study report on recreational demands, the Department of Interior indicated:

> By the year 2000, participation in major summertime outdoor recreation activities will be four times greater than it was in 1960. Only a threefold increase had been anticipated. Outdoor Recreation Trends, a BOR report, shows that public parti-

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[1]Citizens Committee for the Outdoor Recreation Resources Review Commission Report, Action for Outdoor Recreation for America (Washington, D.C.: Government Printing Office, 1963), p. 3.

> cipation in major outdoor recreation activities increased a sturdy 51 per cent between 1960 and 1965.[1]

Acceleration in the cost of land parcels continues to reflect an increased market demand for developable raw land. The Educational Facilities Laboratories in a publication entitled, The Cost of a Schoolhouse, discussed the cost of future land for proposed school sites in San Mateo, California. The Educational Facilities Laboartories reported:

> . . . For example, take San Mateo, a bursting California community. This case study deals with just one phase of their system-wide approach - the acquisition of building sites. It shows how the ultimate economy of a school building program may be determined long before the architect sets pencil to paper. By early acquisition of sites money was saved - $3.5 million to pay for the cost of an entire high school.[2]

It should be noted that five San Mateo school sites were larger than the 1964 recommendations for school sites as proposed by the Council of Educational Facility Planners (formerly named the National Council on Schoolhouse Construction).[3] Furthermore, the urban need for outdoor

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[1]U.S. Department of Interior, Conservation Yearbook No. 4 of Interior, 1968 (Washington D.C.: Government Printing Office, 1968), p. 18.

[2]Educational Facilities Laboratories, The Cost of a Schoolhouse (New York: Educational Facilities Laboratories, Inc., 1960), p. 46.

[3]Council of Educational Facility Planners, NCSC Guide for Planning School Plants (Columbus, Ohio: The Council, 1964), p. 22).

community recreation areas was firmly established through the utilization of the open space school sites in conjunction with recreation-oriented programs.

Educational Advocacy For Larger Sites

As one reflects upon the history of school sites, a definite trend toward larger school sites over the years becomes apparent; however, it is discernible that larger school sites have been proposed because they promote better educational programs. In an article entitled, "The Need for Large School Sites," the writers discuss the new role of larger school sites. Richard W. DeRemer and Billy G. Lauda stated:

> The trend towards larger school sites has been predicted upon the assumption that school grounds should be used to enrich the instructional program. Large sites, properly developed, provide opportunities for enriching academic studies as well as other sectors of the school program.[1]

In order to offer a wide variety of educational experiences as related to environmental learning activities on school sites, it is not only important to consider the size of the site, but also to consider the unique environ-

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[1]Richard W. DeRemer and Billy G. Lauda, "The Need For Large School Sites," American School Board Journal, CXLVIII (April, 1964), p. 72.

mental quality features of the school site. In discussing criteria for school site selection, William B. Stapp stated:

> In selecting school sites, one criterion should be the unique features which can be used to enrich the school's educational program and serve the neighborhood community.[1]

In a recent article entitled, "Places Within Ann Arbor and Nearby Where One May Take Nature Walks," Clarence J. Messner referred to the role of Ann Arbor's large, environmentally developed school sites as related to the contribution of these sites to all the community's citizens. In the words of Messner:

> . . . many of the public schools have small outdoor nature study areas available to the general public. Of importance, these are used by school children under the expert leadership of naturalists for the purpose of teaching our youth some of the principles of ecology and giving them knowledge, appreciations, attitudes and understandings about the outside world of nature.[2]

A publication prepared by the U.S. Soil Conservation Service supports the premise that public school lands should be developed for and devoted to the study of environmental education. The U.S. Soil Conservation Service reported:

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[1]William B. Stapp, "Outdoor Laboratories," in Manual of Outdoor Interpretation, ed. by Joseph J. Shomon (New York: National Audubon Society, 1968), p. 66.

[2]Clarence J. Messner, "Places Within Ann Arbor and Nearby Where One May Take Nature Walks," 24th Annual Conservation Report, XXIV (December, 1972), 25.

> As an integral part of the school site, an outdoor classroom expands the traditional learning environment to a new one that is readily accessible to youth and teachers . . . . it is immediately available for continuous studies, for unexpected observation, for supervised individual study projects, and for capitalizing on the teachable moment.[1]

Thus, rationale for larger school sites appears to be assuming a new quality; the recognition that open space school sites can serve as a fundamental asset in the enrichment of the curriculum.

In examining the needs of an expanded educational curriculum, the desirability for open space school sites becomes apparent. In the Omaha Public Schools Robert Schultze conducted a study which surveyed and recorded present and past practices of school site utilization. The following recommendations were made:

> The recommendations for future planning of the Omaha Public Schools were: (1) Total site size: An elementary school site should include ten acres plus an additional acre for each 100 pupils. (2) Playground: Elementary school sites must provide adequate well-planned space for physical education and community recreational use. (3) On construction of a new building on a new site consideration should be given to leaving an area in its natural state.[2]

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[1]U.S. Department of Agriculture, Soil Conservation Service, Outdoor Classrooms On School Sites (Washington D.C.: Government Printing Office, 1972), p. 2.

[2]Robert Schultze, "The Utilization of Building Sites of the Elementary Schools of the Omaha Public Schools" (Unpublished Ed.D. dissertation, University of Nebraska Teachers College, 1966), p. 82.

In high density habitation areas the need for developing open space school sites concurrently with curriculum expansion is supported by a study conducted by R. D. Srivastava. He said, "The properly equipped school site should provide enough space to aid in the mental and physical development of every child . . ."[1] In a curriculum-oriented study conducted in the State of Virginia, it was proposed to establish site size requirements for the schools in the State of Virginia. The researcher, George Granville Tankard, Jr., indicated:

> Significant conclusions of the study are: The outdoor programs in Virginia's elementary schools are inadequate for three reasons: (a) insufficient space; (b) inadequate facilities, even though adequate area is available, and (c) failure of school faculties to conduct a desirable program despite adequate facilities.[2]

In accordance, larger school sites have been advocated since a report by the Commission on the Reorganization of Secondary Schools was published in 1924. The Commission recommended:

> There is abundant evidence from experience to prove that no high school site should be less

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[1]R. D. Srivastava, School Sites and Spaces in High Density Habitations, Report to the Central Building Research Institute (Roorkee, India: The Institute, 1963), p.4.

[2]George Granville Tankard, Jr., "Site Requirements for Outdoor Instruction for Virginia Elementary Schools" (Unpublished Ed.D. dissertation, George Peabody College for Teachers, 1956), p. 192.

> than three acres for the most modest building. Of this space two acres are necessary for physical education. Five acres is the minimum for a school of 500 pupils.[1]

Twenty-five years later, the American Association of School Administrators stated:

> The size of any school site should be determined by the nature and scope of the contemplated educational program . . .
>
> (a) For elementary schools, five acres plus an additional acre for each hundred pupils of ultimate enrollment.
>
> (b) For secondary schools, ten acres plus an additional acre for each 100 pupils of ultimate enrollment.[2]

The Council of Educational Facility Planners tendered recommendations for the size of minimum school sites. The Council reported:

> For elementary schools, it is suggested a minimum site of five acres plus an additional acre for each 100 pupils of predicted ultimate maximum enrollment.
>
> For junior high schools, it is suggested a minimum of ten acres be provided, plus an additional

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[1] National Education Association, High School Buildings and Grounds, Report of the Committee on the Reorganization of Secondary Schools (Washington D.C.: Government Printing Office, 1953), p. 49.

[2] American Association of School Administrators, American School Buildings (Washington D.C.: The Association, 1949), p. 75.

> acre for each 100 pupils of predicted ultimate maximum enrollment.
>
> For senior high schools, it is suggested a minimum site of 20 acres plus an additional acre for each 100 pupils of predicted ultimate maximum enrollment.[1]

Thus, the past five decades show major changes in the school site requirements of programs which have provided educational standards for recommendations by professional educational organizations for expanded school sites.

School Sites And Municipal Overburden Consequences

A recent development in the field of land economics research is the analysis of the impact that single-family subdivision developments have upon the municipal costs of a suburban region. A recent publication by the Open Space Institute defines the economic land use concept which is receiving national research efforts. In the words of Charles E. Little:

> . . . the "New Municipal Math" - the truism that public service costs in suburbia increase faster than property tax in income as vacant land is subdivided into single family developments.[2]

In essence, the preservation of open space in America's

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[1]Facility Planners, NCSC Guide, p. 22.

[2]Charles E. Little, Challenge of the Land (New York: Pergamon Press, 1969), p. 79.

suburban regions translates into significant dollar savings as measured by the costs of providing municipal public services such as roads, electrical power transmission lines, sidewalk development, and maintenance of roads. According to Charles E. Little:

> In Closter, New Jersey, a controversy arose in 1965 over the acquisition of seven open space parcels totaling some 80 acres. According to an account in the Bergen Evening Record, Major James E. Carson applied a Fitch like formula this way. If the land had not been acquired, 80 acres would accommodate 160 houses. The houses, if constructed would produce about 200 children to be educated at an average cost of $720 for each pupil or a total cost per year of $144,000 annually. Additional garbage collection would cost about $4,000 annually, additional police patroling $6,000, additional fire hydrants, lighting, and other services, $2,000 for a total of $156,000 per year in services.
>
> Carson estimated the tax revenue to be $100,000 a year; therefore, the community's net annual loss would be $56,000.[1]

In a study conducted in Lloyd Harbor, New York, which documented the total effect of developing 1,426 acres into single-family residences, the following results were recorded by Charles E. Little.

> . . . the village board hired a firm of planning consultants to assess exactly what the damage would be, and, yes, it would be significant - an increase of $2.58 hundred, nearly 20% (from $14.33 to $16.91). But that was only a part of what the planners were asked to figure out. Assuming the land would eventually be developed, they set

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[1] Ibid., p. 83.

> up a statistical model based on two-acre plots containing houses worth $35,000. In this case, said the planners to the dismay of some, the tax rate would go to $21.64, and increase nearly three times greater.[1]

It is a point of research fact that the economic effects of municipal overburden are related to limited space school sites. Whereas open space school sites provide significant public service savings proportional to the acreage size accorded to the school site.

School Sites As Sources Of Open Space

The public school system, the land and the potential of the land for open space use, renders a solution to the urgent needs for increased open space in rapidly urbanizing communities. Since public school sites have been located to service residential neighborhoods with a minimum of required transportation, the present-day school site offers the distinct advantage of creating open space.

Open space school sites which are designed for community use can function as a system of open spaces for the increased leisure time of an affluent society. In order for open space areas to be established, most school boards must either acquire additional land or restructure site

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[1] Ibid., p. 84.

development practices in order to offer a land resource to serve adults and youth. According to the authors of the Ann Arbor Schools Site Development and Selection - Advisory Committee:

> Open space school site development can be justified economically. As the quality and 'educational potential' of a school site is improved, the surrounding property value of residential homes is increased. Increased property tax value is reflected by an increase in the tax rate of neighboring lands. Therefore, every time a school millage issue is passed, the school will receive additional funds as a direct result of the impact of the site development.[1]

A major problem confronting public education in the United States is the constant sale and resale of residential housing which is associated with well-established residential neighborhoods. If the turnover rate of neighborhood housing is exceptionally high, the normal school population is affected by changing enrollments and educational programs developed at the public school level diminish in their effectiveness. It has been ascertained that open space school sites have a stabilizing influence on the market sale prices of surrounding residential housing which contributes to lower market sale-resale

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[1] Report of the Ann Arbor Schools Site Development and Selection - Advisory Committee (Opportunities for Environmental Education on School Sites) to the Ann Arbor Board of Education, Russell E. Wilson, Chairman (Ann Arbor, Michigan: Ann Arbor Public Schools, 1971), p.6 (mimeographed).

ratios. In the words of Richard L. Philipson:

> School-park sites in the city of Milwaukee exert a positive influence upon the market prices of nearby residential real estate. Research has indicated that the city of Milwaukee's property tax base has been expanded by school-park combinations which have appreciated the market prices of nearby residential real estate. It appears that a stabilizing influence has been exerted in the school-park neighborhoods as residential sale-resales are significantly lower than comparable neighborhoods which have small, asphalt type school sites.[1]

The stabilization and/or the appreciation of the market sale prices of residential housing associated with the residential neighborhoods of open space school sites is not only important economically but also contributes to the social welfare of a neighborhood.

Economic Influences of School Sites on Neighborhood Property Values

A singular economic phenomenon of open space school sites, i.e., public school-park sites, is their apparent ability to exhibit a "ripple effect" in appreciating the residential market sale prices of real property surrounding the site. In essence, well-developed public land sites

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[1] Interview conducted with Mr. Richard L. Philipson, January 20, 1973, Milwaukee, Wisconsin.

exert a positive market influence upon demand factors of prospective home buyers to be located close to the beneficial land development. It is worth noting the increased market prices of raw land associated with newly developed neighborhood parks, school-park combinations, water reservoir projects, botanical preserves, and/or similar "green island." According to June S. Brown and Russell E. Wilson in an article entitled "Schools Can Be 'Green Islands'":

> Premium prices are paid for homes and apartments near 'green islands', which may consist of good school sites as well as golf courses, parks, rivers, clean lakes, and great trees.[1]

The market sale price appreciation of real estate values which results in the expansion of the surrounding property tax base of open space school sites has potentially eventful fiscal implications for various governmental units, i.e., boards of education, which rely upon the property tax revenues as a major source for the support of public services. In support of this premise that good sites expand the property tax base, research was conducted by Russell E. Wilson which measured the fiscal influences of a fifteen acre school-park combination (Burns Park, Ann Arbor, Michigan). In the words of Wilson:

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[1] June S. Brown and Russell E. Wilson, "Schools Can Be Green Islands." Michigan Education Journal, XLII (April 1965), p. 20.

> Ann Arbor's Burns Park has demonstrated that 'open spaces' in conjunction with adequate school sites coupled with public recreational facilities causes marked increases in assessed property valuations for several blocks surrounding the school site. This effect resulting in raising nearby property values has been termed the 'ripple effect.' Usually purchase prices of such 'open space' sites are recoverable through increased property tax revenues from remaining nearby parcels within thirty years. For proof, check the rising tax revenues from properties close to newly cleared 'open spaces' in a high density urban area.[1]

A doctoral dissertation by William L. Hafner investigated the market value appreciation rates of residential housing surrounding two elementary school sites in Ann Arbor, Michigan. The subject school sites were Thurston Elementary, a twenty-two acre site including ten acres devoted to a nature preserve and Lawton Elementary, a 7.7 acre site. The investigation tested the following hypotheses:

1. The rate of value change for houses located in open space school site neighborhoods diminishes as houses lie further from the open space site.

2. The rate of value change for houses located in standard school site neighborhoods diminishes as houses lie further from the standard site.

3. Houses differing only as to their location in an open space or standard school site neighborhood and adjusted for the independent

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[1] Interview with Dr. Russell E. Wilson, University of Michigan, March 9, 1972.

variables of living area, number of rooms, and lot size, differ in annual rate of value change.

4. Houses differing only as to their location in an open space or a standard school site, and adjusted for the independent variables of living area, number of rooms and lot size, differ in proportional rates of assessed valuation relative to sale price.[1]

Based upon the data results, Hafner reached the following conclusions:

1. Distance from the school site had no clear relationship upon the rate at which houses increased in value for houses located in either type of neighborhood.

2. The school system's investment in the open space site was partially negated since houses surrounding the open space were under-assessed relative to those in the standard site neighborhood.

3. If the open space houses had been assessed at the same relative rate as the standard site houses, approximately $182,700 more tax base would have been available for school revenue purposes.

. . . . . .

4. Houses located in the open space neighborhood appeared to increase in value more than twice as fast as the houses located in the standard site neighborhood.[2]

The major finding of this research study was the higher

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[1] William L. Hafner, "The Economic Feasibility of School Sites as Sources of Urban Open Space" (unpublished Ph.D. dissertation, The University of Michigan, 1972) pp. 26-27.

[2] Ibid., pp. 91-92.

market value appreciation rates of residential housing surrounding the open space school site. The underassessment of residential housing associated with both school site neighborhoods is inherently a major problem associated with our property tax system. It was also noted that no clear linear relationship developed between market value appreciation rates and the location of residential housing of the subject site neighborhoods. This finding may refer to other variables within the elementary school service area, i.e., future plans for open space designation of land areas within the elementary school service area.

In a doctoral dissertation in progress at The University of Wisconsin, Madison, significant evidence has been documented by Richard L. Philipson regarding the economic impact of elementary school site development practices upon the market prices of nearby residential real estate. The study was conducted in the City of Milwaukee and measured the market price trends of residential housing from 1957 through 1967. Six elementary school site neighborhoods formed the population sample, three open space site neighborhoods and three comparably matched traditional school site neighborhoods. The study investigated market sales data of residential housing of Clement Avenue School - 19.5 acres, Burdick School - 3.8 acres, 82nd Street School - 14.6 acres, 81st Street School - 3.82 acres, 78th Street School - 12.76

acres, and 55th Street School - 5.91 acres.

The study tested the following hypotheses, using an analysis of covariance model for statistical treatment.

1. There is no significant difference in the market price trends of residential property located nearby open space elementary school sites and the market price trends of residential property located nearby traditional elementary school sites.

2. Market price trends of residential property are directly related to the proximity of residential property to the elementary school site.

    a. Proximity to an open space elementary school site will have a positive effect upon the market price trends of residential property.

    b. Proximity to a traditional elementary school site will have a negative impact upon the market price trends of residential property.[1]

Philipson's data indicated the following results:

1. The three Milwaukee open space elementary school sites exerted a positive influence upon market prices of nearby residential real estate; the property tax base of the open space neighborhoods were positively affected; and a stabilizing influence appeared to be exerted in the residential housing marketplace.

2. The market price trends of residential property are directly related to the proximity to the site. Residential properties located

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[1]Richard L. Philipson, "The Market Price Impact of Elementary School Site Development Practices upon Nearby Residential Real Estate," Department of Education, The University of Wisconsin, Madison, 1973, p. 22-23 (Mimeographed).

close to open space school sites were selling for higher market prices than similar housing located further from the site. Residential housing located close to traditional school sites were selling for lower market prices than similar housing located farther from the site.

3. The linear distance that the elementary school site affects property values is nearly equivalent to the elementary school service area boundaries. The impact of the site upon residential housing price trends was most pronounced, i.e., Clement Avenue School housing increased $217. - per year as compared to Burdick School housing which only increased $115. - per year. The 82nd Street School housing increased residential housing values more than double that of the comparable 81st Street School as measured over a ten year duration. The 78th Street School yielded $1,363. - per house over a ten year period as compared to 55th Street School housing increases of only $542. - net gain.

4. Analysis of data from the Milwaukee property tax assessment rolls indicated that the property tax base of open space elementary school site neighborhoods was nearly double that of the matched traditional school site neighborhoods.

5. The potential for enlargement of the traditional, big-city 'asphalt jungle' school sites to a greensward 'open space' is not only feasible by urban land values and tax revenue economics, but it is encouraged by the indications of these data.[1]

The writer recently concluded a doctoral study entitled "The Economic Influences of Elementary School Sites on Residential Property Tax Revenue In Selected Urban Neighbor-

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[1] Interview with Richard L. Philipson, Milwaukee, Wisconsin, December 28, 1972.

hoods"[1] which measured the economic impact of urban elementary school sites and buildings on the surrounding residential property tax base.

In developing the research criteria for this study, the writer evaluated 75 (seventy-five) Michigan school districts and their respective elementary school site neighborhoods to insure comparable sample populations. Elementary school site neighborhoods were selected for detailed data-gathering and statistical analyses and included the comparable characteristics of: (1) relative land acreage sizes; (2) degrees of site development; (3) types of schoolhouse construction; (4) matched single-family residential housing units; and (5) similar socio-economic stratification within subject neighborhoods.

The study selected matched pairs of elementary school site neighborhoods in the school districts of Dearborn and Lansing, Michigan. Market sale price histories of the subject population, 1224 (one thousand two hundred twenty-four) were obtained for single-family residential housing units for five, large, open space elementary school site neighborhoods and for five, comparable, small, limited space

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[1] Grube, Karl W., "The Economic Influences of Elementary School Sites on Residential Property Tax Revenue In Selected Urban Neighborhoods." (unpublished Ph.D. dissertation, The University of Michigan, 1973).

elementary school site neighborhoods. Pertinent market sales data, building and site data, and neighborhood profile data which occurred during the period of 1952 through 1971 were collected and statistically analyzed.

The study tested and rejected the following four null hypotheses.

H_o = There is no significant difference in the last sale price of residential housing as adjusted for the covariates of the first sale price, the number of years between sales, and the number of streets crossed for large, open space and for small, limited space elementary school sites.

H_o = There is no significant difference between the relationship of the number of streets crossed and the first sale price for large, open space and for small, limited space elementary school sites.

H_o = There is no significant difference between the relationship of the last sale price and the number of streets crossed for large, open space and for small, limited space elementary school sites.

H_o = There is no significant difference between the relationship of the projected potential additional property tax revenue yield and the last sale price of residential housing as adjusted for the covariates of the first sale price, the number of years between sales, and the number of streets crossed for large, open space and for small, limited space elementary school sites.

On the basis of the statistical analyses of the data, the following conclusions were reached:

1. The combination of: educational, community, and landscape developed acreage; natural or manmade amenities; good site development practices; good site design; and, site maintenance, were influential in contributing to higher market sale prices of residential housing surrounding the subject elementary school sites.

2. The enlargement and conversion of a formerly small, limited space elementary school site into the site criteria standards of a large, open space elementary school site did increase the market sale prices dramatically; thus, the most recent market sale prices in the neighborhood equaled those recorded around the comparable, large, open space elementary school site.

3. The size of the land acreage of large, open space elementary school sites was related significantly to the higher market sale prices recorded on residential housing units sold in the subject neighborhoods.

4. The size of the land acreage of small, limited space elementary school sites was related significantly to the lower market sale prices recorded on residential housing units sold in the subject neighborhoods.

5. When developed parkland was the major portion of an elementary school site, these parklands influence positively the market sale prices of nearby residential housing.

6. The land acreage size and the degrees of school site development of the elementary school sites surveyed in this investigation exerted positive and negative influences on the recorded market sale prices of residential housing units as far away as five street crossings from the site.

7. The residential housing units located in close proximity to large, open space elementary school sites produced higher market sale prices than did comparable residential housing located at the same proximity to small, limited space elementary school sites.

8. The residential housing units that were located one, two, and three street crossings away from large, open space elementary school sites were selling for higher mar-

ket sale prices than similar residential housing units located farther from the site.

9. Higher market sale prices were recorded for residential housing units located near well-developed small, limited space elementary school sites as compared to similar residential housing units located four or more street crossings away from the subject site.

10. The projected potential additional property tax revenue yields from residential housing units surrounding large, open space elementary school sites can be sufficient to pay the additional investment for open space acreage, site development, and site maintenance when collected over a thirty-year period.

Concluding Remarks

It is time for school officials through the auspices of public education policies to develop systematic approaches to solving environmental problems. One of these approaches is the development and utilization of a community-owned land resource--the public school site.

Sufficient research has been generated to economically justify the necessary capital investment expenditures in developing the public school site into a community land asset. Open space school sites, designed, developed and maintained as community land reserves, are self-liquidating

economic land units because they contribute significantly to the expansion of the surrounding property tax base and because they provide municipal dollar savings by reducing the public expenditures for additional municipal services associated with smaller public land units.

Open space school sites as publicly-owned land resources can serve as a focal point for the beneficial socialization of neighborhood residents as well as the common land catalyst to establish the neighborhood land ethic values necessary for citizen involvement in formulating the approaches to solve the environmental problems confronting the society.

Accordingly, it behooves school officials to develop and implement comprehensive public land use policies applicable to the enhancement of the public school site. These public policies can insure the environmental quality of community-owned school sites and create a land resource which rightfully belongs to future generations as part of their "inherited public land rights."

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SCHOOL SITE DECISIONS AND DOLLARS

School Board Policy as Related to Economic Alternatives for Open Space School Site Planning

"The capital outlay expenditures of several million dollars for school-park development in the city of Flint are being capitalized in the form of an expanded property tax base--the school-park not only has become a municipal economic asset but also a community land resource reserve."

Dr. Karl W. Grube

Lecturer, School of Education,
Eastern Michigan University,
Ypsilanti, Michigan 48197

and
Lecturer, School of Education,
The University of Michigan,
Ann Arbor, Michigan 48104

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> "The capital outlay expenditures of several million dollars for school-park development in the city of Flint are being capitalized in the form of an expanded property tax base--the school-park not only has become a municipal economic asset but also a community land resource reserve."

A nationwide interest exists in the problems associated with the continuing deterioration of our environment. Research evidence is released daily to substantiate the problems associated with air and water quality, fossil fuel energy depletion, multiple abuses of land development projects, increased densification of urban land areas, and the urban sprawl of suburban communities into the prime agricultural soils of rural countryside.

Through the auspices of the news media, the average citizen is confronted with daily accounts of land-use/abuse which are undoubtedly further magnified by the citizen's visual evaluation of the poorly planned economic development of his community. This citizen reflects upon his youth and remembers the natural areas of greenery; the vacant lots which were his domicile for exploration; the relatively few numbers of automobiles which penetrated his neighborhood; and the considerably lower levels of noise, dust, and water contaminants. The "common land" of his youth has been replaced by a variety of man-made physical structures, i.e.,

office buildings, highways, apartments, which impart the feeling that the environment has been altered to such a degree that the "common land" for his children has been severely restricted. Therefore, it behooves communities through their locally elected officials, i.e., school board members, to recreate open space land resources which provide the "common land" for children and youth as well as adults.

Accordingly, open space school site projects can be justified economically because these projects are self-liquidating economic resources. These open space land resources positively influence the market value of surrounding lands to the extent that the increased property tax revenues generated by an expanded property tax base repays or capitalizes the capital expenditures for land acreage development costs and maintenance costs. Further, open space school sites should be incorporated as public policy for all school districts because these land resources provide the necessary land requirement for an improvement in the immediate environment and in the land quality which is assigned to posterity.

Economic Influences of Parks, Open Space, and Recreation Land on Property Values

Economic Contribution of Parkland

Various research efforts have been made over the years to establish an economic rationale for the preservation of open space within our urban cities. In reviewing the

literature, a prominent theme emerges: *developed parkland extends positive economic benefits to surrounding lands.* For instance, Charles E. Little reported a study undertaken by the Union County, New Jersey Park Commission covering the time span of 1922 through 1939:

> . . . 631.7 per cent increase in the assessed valuation of properties within a quarter mile of their Warinanco Park, while the assessments in the city as a whole, Elizabeth, New Jersey, averaged 256.7 per cent increase.[1]

In a similar time span, Charles M. Herrick in an article entitled "The Effect of Parks Upon Land and Real Estate Values," developed a general land economic formula in attempting to determine the beneficial affects of Washington, D.C. parkland to economic value of other lands. Herrick said:

> The hypothesis was that a relationship between real estate value and percentage area of a city in park land appeared when cities were grouped according to the population density. . . . A general equation was worked out and applied to Washington, D.C., proving that the presence of park land in the city did indeed increase real estate value to the point where the increase in tax revenue more than paid for the cost of the parks.[2]

In a study concluded in 1958 by the National Association of Home Builders, a measurement was undertaken to determine the economic impact of parkland on surrounding residential real estate values. The study employed market sales

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[1]Little, Challenge, p. 87.

[2]Charles M. Herrick, "The Effect of Parks Upon Land and Real Estate Values," The Planners Journal, V (October-November, 1939), 89.

data throughout the United States and derived several major conclusions. The Association stated:

> It should be pointed out that where land is developed for park purposes, the highest increment of value is usually developed in properties immediately contiguous. This is not necessarily the case with playgrounds, where activity and noise of field sports and the like may be objectional to adjacent homes. It is important that playground areas be properly screened and buffered from adjacent residential use if this objection is to be avoided.[1]

In a 1961 study for the Coro Foundation, Robert Wonder sought to determine the extent that parkland affected the property tax assessment rolls. Wonder assumed that well-designed parkland in the metropolitan area of San Francisco would create higher assessments upon bordering residential housing than similar housing without access to parkland. Charles E. Little discussed the technique and results of the Coro Foundation Study:

> Wonder searched out two parks in Oakland whose neighborhoods were more or less unaffected by wayward influences.
>
> . . . mean assessment adjacent to the park was $3,416 and a block or two away considerably less. For tier two it was $2,300 and for tier three $2,355. . . . [The San Antonio Park neighborhood yielded] mean assessment was $1,489 for adjacent blocks and for two and three blocks away $940 and $1,006, respectively.
>
> He divided the control area into three tiers, just like the San Antonio Park area except that tier one was fronting on other houses rather than a park. Here, he found much smaller differences in the mean valuation of each tier, and of course no pattern. One tier was $876, another $932, and another $1,195,

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[1]Home Builders, Manual, p. 194

> the greatest difference being 24%, and the overall value of the control area significantly less than the overall value of the San Antonio Park neighborhood.[1]

In researching the economic concept that parkland positively affects surrounding market price appreciations of residential properties, William S. Hendon and James W. Kitchen tested the hypothesis that as "real estate properties lie further from a neighborhood park, their value diminishes."[2] Hendon and Kitchen selected the A.B. Davis neighborhood park, consisting of ten acres, play equipment for all ages, well-landscaped areas and a shelter as the subject site. The park is located in the geographical center of Lubbock, Texas, and has homogeneous neighborhood characteristics as reflected by similar housing types and price ranges. Hendon and Kitchen concluded the study with these appropriate comments:

> This study demonstrated that the distance of a property from a park might affect its value to this extent: land values tend to be influenced by among other things the distance of the property from a neighborhood park. Within the zone of influence of the park, as a parcel of land is more distance from the park, its value decreases. Although sale prices of properties did not relate to distance from the park, the fact that land value did is highly significant because land valuations in the community made wide use of sale figures of comparable land.

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[1] Little, Challenge, pp. 88-89.

[2] William S. Hendon, and James W. Kitchen, "Land Values Adjacent to an Urban Neighborhood Park," Journal of Land Economics, XLIII (August, 1967), 358.

> Thus the relationship between land values and park proximity is in fact indicative of a demonstrable market relationship.[1]

The Sociological and Economic Impact of Urban Parks in Dallas, Texas, 1966,[2] a study conducted by the Park Administration faculty of Texas Technical College, measured certain social and economic influences of thirteen urban parks as related to adjoining residential neighborhoods. Of particular importance is the economic contribution of school-park combinations upon the market values of surrounding neighborhood real estate. The economic portion of the study was designed to measure the following hypotheses:

1. The distance from which the park affects the property value is approximately equivalent to the service area of the park.

2. In the case of a park which is associated with a school (which typically reduces the value of near or adjacent residential properties), the park may reduce the detrimental effect of the school on surrounding property values.

The research study supported the two hypotheses and presented additional fiscal implications in the form of primary and secondary economic benefits, i.e., a well-

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[1]Hendon and Kitchen, "Land Values," p. 359.

[2]Department of Park Administration, School of Agricultural Sciences, Texas Technical College, The Economic and Sociological Impact of Urban Parks in Dallas, Texas, 1966 (Lubbock: Texas Technical Press, 1967), p. 1:14.

integrated school-park combination will generate the most significant economic impact upon surrounding property values, both in total assessed value and land value correlations.

A follow-up study of The Sociological and Economic Impact of Urban Parks in Dallas, Texas, 1966, was conducted by park administration researchers in the city of Fort Worth, Texas. The 1969 research project measured certain social and economic influences of three urban parks as related to adjoining residential neighborhood housing. A portion of the study was designed to supply answers to the following questions which are stated in the form of hypotheses.

1. The distance that the park affects the property value is approximately equivalent to the service area of the park.

2. In the case of a park which is associated with a school (which typically reduces the value of near or adjacent residential properties), the park may reduce the detrimental affect of the school on surrounding property values.

3. Parks in Fort Worth affect property values in the same manner as do parks in Dallas.[1]

The study accepted the three stated hypotheses and verified the primary and secondary economic results of the Dallas research.

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[1]Department of Park Administration, School of Agricultural Sciences, Texas Technical College, A Parks Appraisal: Regional Facilities (Lubbock: Texas Technical Press, 1969), p. 5.

Economic Contribution of Open Space

Land development companies often have realized the positive economic impact of preserving open space, and have incorporated open land into the total design. In surveying the activities of developers, Carl Norcross stated:

> If a developer creates an outstanding environment, saves trees, has a good street pattern, and then adds a pool and a modest recreation area, he might easily get $500 or $1000 more per house than he would for the same house in an ordinary subdivision.
>
> Proof that developers who tried open space and better land planning believe in them, is that in their next developments they have gone even further to provide more open space, more recreation and better community facilities.[1]

The Urban Land Institute conducted a study of twenty-eight open space subdivision developments in 1966 as reported by Norcross. The projects covered all socio-economic levels with low income market prices of $11,500 per single-family dwelling to $60,000 per residence for high income neighborhoods. The opinion of the Urban Land Institute, as reported by Norcross, regarding the preservation of developmental acreage for open space park, swimming pool, and other recreational usage was:

> The basic questions this investigation set out to answer are: Are open space communities successful? Do open space, cluster planning, parks, a good street plan, and community features such as recreation help the sale of new homes and apartments?

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[1]Carl Norcross, Open Space Communities in the Market Place - A Survey of Public Acceptance (Washington, D.C.: The Urban Land Institute, 1966), p. 33.

> The answer is yes--but only if the home or apartment has real value in that particular market.
>
> When a house or apartment is considered a "good buy," then open space and related community features are of real value in selling. The people who live there say so. The developers, builders, sales staff and lenders say so![1]

A basic conclusion of this study was that open spaces, landscaped and developed for recreational purposes do indeed add market value to single-family residences. The implication for public school districts is clear: increased property value yields higher property tax revenues.

Economic Contribution of Recreation

The development of sites for recreational purposes is significant in producing positive economic affects upon the price of surrounding lands. The documentation of public and private development dedicated to recreational usage is a common theme of the literature. For example, Kenneth D. Daane in studying the economic implications of regional park systems indicated:

> Public recreational facilities have significant effects upon the surrounding land and property values. In many cases the development of park facilities has increased the values of surrounding realty to the point where the increase in tax revenue

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[1] Ibid., p. 39.

more than paid for the cost of the parks.[1]

The city government of Prescott, Arizona decided to develop a parcel of city-owned land into a golf course. The economic results of the project have had a profound influence upon surrounding land values and the revenues collected from them. According to Charles E. Little:

> In the city of Prescott, Arizona, Crabtree reports, the city built a golf course on land valued at $25 an acre. After that, city officials turned around and sold adjacent land to subdividers for an average of $2,277 per acre. "It is anticipated that the development of this land will add over $3,000,000 to the city's taxable values in the next ten years," according to the city officials.[2]

The positive economic impact of recreationally developed sites was documented by Professor Raymond D. Thomas for the Outdoor Recreation Resources Commission in a series of reservoir studies in Oklahoma and Arkansas. Professor Thomas measured the property tax revenues generated before and after the completion of the reservoir projects. He stated:

> In terms of dollar volume, the increase in county revenues flows from a rise in the value of taxable property is the most important result of the coming of recreation. The increase could be even larger if counties could be induced to undertake a general reassessment of property to reflect

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[1]Kenneth D. Daane, The Economic Implications of The Regional Park System in Maricopa County (Flagstaff, Arizona: Arizona State University Press, 1964), p. 46.

[2]Little, Challenge, p. 86.

> the rise in value that occurs near the reservoirs.[1]

The results of Thomas' reservoir studies indicated that increased property tax revenues accrued when recreation was applied to the reservoir areas. Accordingly, it could be ascertained that recreationally developed open space school sites could also have positive economic influences upon surrounding residential property values.

Real estate companies have often recognized the wisdom of developing water-oriented recreational areas in conjunction with residential properties. Jack L. Knetsch studied the influence of a water reservoir project upon the values of land. Knetsch's assumption was that a significant difference would exist between the original price of land and the final developed price. He measured the difference in land prices before and after the sales; employed an inflation index to adjust the prices and noted the differences. Knetsch observed that "the increased sales prices of land adjacent to the reservoir project reflected values due entirely to their proximity to the reservoir project."[2]

A study prepared by the National Park Service indi-

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[1]Outdoor Recreation Resources Commission, Economic Studies of Outdoor Recreation (Washington, D.C.: Government Printing Office, 1962), p. 149.

[2]Jack L. Knetsch, "Influence of Reservoir Projects on Land Values," Journal of Farm Economics, XLVI (February, 1964), 241.

cated that reservoir projects have positive economic consequences in returning property tax revenues to local school districts. The Service indicated:

> The gain in revenues for school districts is not matched by a proportionate increase in school-age children, so the affect on the quality of education should, in the long run, be marked. The example of the Grove School District at Grove (Okla.) was cited, where assessed valuations rose from $1,150,000 to $1,750,000 in five years due to the construction of cabins, camps, cafes, and the like along Grand Lake. During the same period, the number of children in the district school rose by only 37 on an average daily attendance basis.[1]

Economic Contribution of Open Space Planning

A prominent trend in suburban development has been the preservation of large tracts of land dedicated to public purpose because these lands are felt to increase municipal income potentials. Charles E. Little reported:

> . . . Wallace-McHarg, Philadelphia planners, showed a significant difference in development value in a comparison of optimum development versus a forecast of development patterns if present trends continued in the Green Spring and Worthington Valleys outside Baltimore. In their Plan for the Valleys, calling for preservation of 3,000 acres of meadowland, they state: "It has been calculated that uncontrolled residential growth develops approximately $33.5 million (in land value) by 1980, and Optimum Land Use residential development produces $40.5 million in the same period. The additional $7

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[1]Institute of Community Development, An Analysis of the Tourist Industry in Selected Counties of the Ozark Area. Report for the National Park Service (Washington, D.C.: Government Printing Office, 1953), p. 152.

> million resulting from concentration would be adequate to pay in excess of $2,300 per acre for title to the 3,000 acres exempted from development."[1]

The significance of increased income for school purposes is of prime importance in considering the financing of public education. A major problem for public education, especially city school systems, is the high density of population, concentrated upon small land acreages. If a more random distribution of our urban population could be accomplished, i.e., creation of more open space with less density per square mile, a more equitable distribution of property tax wealth can result. According to a survey in the city of Milwaukee by Richard L. Philipson:

> In surveying several blocks in Milwaukee, Wisconsin's inner residential core (pre-1930, one to four family houses where some 40' by 100' lots have two structures housing a total of four or more families) the author ascertained at least an average of sixty family dwelling units in a city block comprising less than three acres. If each one of these families sent only one child to public schools . . . annual education expenditures per block are a minimum of $38,460 (or $641 per child for 60 children). Does such a block produce that much school property tax revenue to support schools? Seldom--if ever![2]

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[1]Little, Challenge, p. 86.

[2]Richard L. Philipson, "The School Site - Asphalt Jungle or Open Space?" The Michigan School Board Journal XIV (January, 1968), p.6

Accordingly, the preservation of open space, whether by private or public designation, can produce revenue for public services in three significant ways:

1. Open space can reduce municipal expenditures by costing less to service.
2. It yields additional tax revenue by increasing the market prices of surrounding real estate properties.
3. It can generate income directly through user fees or because a parcel of open space, privately owned, is subject to property tax assessment procedures.

Economic Values of Site Design Features

Educational Development Factors of the Site

In 1972, public school sites in the State of Michigan average 10.13 acres; elementary school sites had a mean size of 5.37 acres and a median size of 3.14 acres.[1] In considering the space requirements for the elementary school plant, a building housing 500 pupils with two acres devoted to a sealed surface playground, there is limited acreage available for the educational development of the pupil. Donald A. Jones commented upon the size requirements as related to modern elementary school construction needs:

> The proper size of the site has been considered only in recent years. Many buildings

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[1]Michigan Department of Education, School Plant Planning Section, Calculations based upon Computer Program SO316, February 10, 1972.

> built 50 years ago were built on sites adequate for only the building itself. Only a generation ago, a city block was considered adequate for a grade school . . . Modern one story grade school buildings generally occupy twice the space that was covered by the old two and three story buildings.[1]

Unfortunately, most Michigan school sites are too small in terms of educational space to provide adequate outdoor programs. Recognition should be accorded to public school lands as an integral portion of a child's learning process and developmental growth rather than a mere parcel of real estate to situate a building. The school site is a fundamental part of the educational plant and more especially provides the medium for the educational program. The Council of Educational Facility Planners stated that "the enhancement or curtailment of the total school program is directly related to the size and quality of the public school site."[2]

The recognition by the Michigan State Legislature in 1912 that public schools of Michigan be required to teach the economy of nature (ecological relationships of the land) is a well-established precedent; however, the three to five acre school site of today offers a limited potentential for complete implementation of this statute.[3]

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[1]Jones, "School Site Selection," p. 75.

[2]Facility Planners, NCSC Guide, p. 23

[3]General School Laws of Michigan, (254), 340.365, Section 365, Humane Treatment and Protection of Animals, Birds, Economy of Nature.

The statute reads:

> In every public school within this state, a portion of the time shall be devoted to teaching the pupils thereof kindness and justice to, and humane treatment and protection of, animals and birds, and the important part they fulfill in the economy of nature. It shall be optional with each teacher whether such teaching shall be through reading, stories, narratives of daily incidents or illustrations taken from personal experience. This instruction shall be a part of the curriculum of study in all the public schools of the State of Michigan.[1]

If the enlightenment of our young citizens regarding their environment is to be fully realized, a fundamental land resource for the teaching of these environmental constructs is an adequate-sized, and well-developed school site. If the school site size standards of the Council of Educational Facility Planners[2] were translated into state mandates, this would allow for a minimum site of twelve acres for each residential neighborhood in America.

Community Development Factors of the Site

The emergence of an expanded public school program in the community is well-illustrated by a national trend toward community educational programs, focusing upon the public school facility and site to implement these programs. A major contributor to the enhancement or failure

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[1] Ibid.

[2] Facility Planners, NCSC Guide, p. 23.

of community educational programs is the size and quality of development associated with the public school site. In relating the importance of building and site utilization to a community educational program, William G. Carr remarked:

> The lights ought to burn later in the school buildings, and the school grounds and other facilities ought to be available for public use more hours per day, more days a week, and more weeks a year.[1]

In considering the potential community use of public school buildings and sites, a national study was prepared by the National League of Cities for the Department of the Interior, Bureau of Outdoor Recreation. The study surveyed the recreational needs and existing programs and facilities of fifteen urban cities. A major recommendation of the study was:

> School facilities in particular, even in jurisdictions having city-school recreation agreements, are not being utilized effectively. To meet the rising demand for recreation, in spite of the declining availability of open space, cities must expand the multiple use of facilities, establish park-school complexes and employ imaginative designs and new construction techniques.[2]

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[1]William G. Carr, "A Sense of Indignation," in The School and Community Reader: Education in Perspective, ed. by Edward G. Olsen (New York: The MacMillan Company, 1963), p. 190.

[2]National League of Cities, Department of Urban Studies, Recreation in the Nations Cities - Problems and Approaches (Washington, D.C.: Government Printing Office, 1968), p. 1.

Most authorities in the field of recreation agree that the optimum utilization of potential recreation resources is not being achieved in most of our nation's cities. On the other hand, some urban cities are making significant efforts to utilize underdeveloped land resources for recreational purposes. It is appropriate to cite a joint school-park project in the city of Flint, Michigan. The project, a development of fourteen school-park sites, was initiated in 1964 with the cooperative efforts of the Mott Foundation, the Flint Board of Education, the Flint Recreation and Park Board, and the school community with ten of the fourteen school-park sites being completed at this present time. Mr. Charles Towar, Chief Construction Engineer for the Flint Board of Education, indicated certain social and economic benefits of the multimillion dollar enterprise. He said:

> For years much of this land was undeveloped and unused. Many acres contain mature deciduous trees. All of it is owned by the Flint Recreation and Park Board and the Flint Board of Education. Most of it is located in living areas, where great numbers of children could benefit from enlarged outdoor recreation facilities. The capital outlay expenditures of several million dollars should be capatalized in the form of an expanded property tax base. It has been our experience in previous school-park developments in the city of Flint that school-park combinations are significant economic as well as community assets.[1]

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[1]Interview conducted with Mr. Charles Towar, Chief Construction Engineer for the Flint Board of Education, March 28, 1972.

School sites and public parks should be in close proximity to each other. Unfortunately, many communities have not accepted this planning approach to community organization. Russell A. Holy indicated:

> Public playgrounds, parks and school buildings have only too often been located without reference to one another.
>
> . . . . . .
>
> Proper cooperation between boards of education and park departments will facilitate greater recreational accommodations for both children and adults. School grounds should be large enough to provide sufficient recreation area, and also, to meet the needs of the people living in the school district.[1]

In order for public school sites to become genuine community assets, boards of education must work more cooperatively with complementary governmental agencies, i.e., parks and recreation boards. This joint cooperation as noted most recently in Flint, Michigan can produce significant community results.

Landscape Development Factors of the Site

Historically, most public school systems have given limited consideration to the natural landscape features or the creation of manmade landscape amenities on school sites. The Michigan Natural Areas Council School Site Committee stated:

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[2]Russell A. Holy, "Cities and School Plant Planning Go Hand in Hand," School Executive, LXXV, (July, 1956), 75.

> For this reason many of the educational features of school sites are lost during the construction stage. The site is leveled, natural vegetation is stripped from the land, and natural water courses are altered and put under asphalt. This approach to school site development results in reduction of the "educational potential" of the site and degradation of its aesthetic appeal.[1]

Undoubtedly, the degradation of the natural landscape elements of our school sites has had an adverse affect upon surrounding residential real estate values. In discussing the negative influences of poor, undersized school sites, Donald W. Bush and S. Herbert Hare indicated:

> Often the site was inadequate in size, almost completely ungraded and without any trees or other plantings to relieve the bareness. Such a development was naturally a blot on the community, usually reducing property values around it.[2]

Richard Tonigan in an article entitled "Keeping the School Site an Asset," alluded to the economic influence the school sites have upon the surrounding property tax base. In the words of Tonigan:

> The owners of property in the school neighborhood are visibly influenced by the day to

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[1]Michigan Natural Areas Council, School Site Committee, The Establishment of Outdoor Classrooms on School Sites as Public Policy. Report prepared for MNAC (Ann Arbor, Michigan: The Council, 1972), (mimeographed), p. 1.

[2]Donald W. Bush and S. Herbert Hare, "The Landscape Architect's Part in the Development of an Adequate School Ground Program," The American School and University, XIII, (September, 1941), 86.

> day appearance of school grounds. Nearby homes and businesses will tend to be more neatly maintained if school grounds set the pace. More yards will be kept in attractive condition and more homes will be kept in good repair. And, in the end, these properties will attain their maximum tax value.[1]

Studies are available which have attempted to measure the contribution of landscape amenities to the market prices of residential housing. For example, a recently concluded study by Brian R. Payne, Forest Research Economist, Northeastern Forest Experiment Station, Amherst, Massachusetts, indicated that mature urban shade trees associated with residential lots in the city of Amherst add between three and ten per cent to the market sale prices of residential property as compared to similar residential housing without trees.[2]

Assistant Professor of Forestry, Michigan State University, J. James Kielbaso cited numerous reports which seem to indicate that trees do contribute to marked appreciation of property values. He stated:

> In most cases we find that the street trees are one of the most valuable assets of a com-

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[1]Richard Tonigan, "Keeping the School Site an Asset," School Management, XIV (June, 1970), 34.

[2]Brian R. Payne, The Contribution of Trees to Property Values in Residential Neighborhoods of Amherst, Massachusetts. Report to the Northeastern Forest Experiment Station (Amherst, Mass.: The Service, 1972), (mimeographed), p. 18-20.

> munity. . . . In many cities these values are carried on the city books as city assets. As you notice the values for individual trees, they may be from $70 to $500 per tree. We are certainly not discussing an exact science. At the present time most people would agree that street trees should be valued at between $200 and $400 each.[1]

According to the eminent Forester, Karl Dressel:

> Street trees represent one of the half dozen most valuable assets the city has in improvements and it is not far below in dollar value the investment in schools, streets, sewers, and water supply.[2]

In a study of the relationship of forests and open space to property values, E. Gould reported:

> . . . that property values in the Northeast seem to vary with the amount of forest and open space. The best of the suburbs have approximately 90 acres of forest or open space per 1,000 people, which is very close to . . . 100 acres once dreamt up as a desirable aesthetic goal.[3]

Also, national realty authorities are credited with adding between $500.- to $1,000.- increased valuation per home in areas beautified by a sound tree planting, as

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[1]J. James Kielbaso, Economic Values of Trees in the Urban Locale. Report to a symposium on the Role of Trees in the South's Urban Environment, Athens, Georgia, February 2, 1971 (Athens, Georgia: The Symposium, 1971), p. 85.

[2]Karl Dressel, Street and Park Tree Evaluation. Report to the International Shade Tree Conference, Toronto, Canada, August 6, 1963 (The Conference, 1963), p. 105.

[3]E. Gould, Values, Trees and the Urban Realm. Report to a Symposium on Trees and Forests in an Urbanizing Environment, Amherst, Mass., August 19, 1970 (Amherst, Mass.: The Symposium, 1970), p. 22.

reported by Irving Johnson.[1]

Further, the Los Angeles Beautification Committee, as reported by Virginia Baldwin, was instrumental in planting grass and trees rather than parking meters on the center road right-of-way. Seven years later, in 1958, values were $100.00 per front foot; the values had increased twenty times in the area.[2]

When considering the economic values of school sites, one can refer to open space and amenity values as contributing factors to the general rise in the market price levels of surrounding residential real estates, i.e., significant variety of mature shade trees; however, as stated by J. James Kielbaso:

> . . . firm values are difficult to obtain. Most people admit tree values but are not certain as to the amount. How can you assign value to intangibles, amenities, or the ability to sell a property with trees much faster than without?[3]

Economic Recommendations Regarding the Formation of Public School Site Policy

Solutions to environmental problems of land develop-

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[1]Irving Johnson, Planning and Implementing a Municipal Street Tree Program. Report to the International Shade Tree Conference, Toronto, Canada, August 22, 1956 (Toronto, Canada: The Conference, 1956), p. 220.

[2]Virginia Baldwin, Should Trees be Planted in Business Areas?. Report to the Western Shade Tree Conference, Anaheim, Calif., May 23, 1958 (Anaheim, Calif.: The Conference, 1958), p. 240.

[3]Kielbaso, Economic Values of Trees, p. 86.

ment and utilization can be formulated and implemented by elected public officials, i.e., school board members. If systematic approaches of open space planning are implemented by school officials, the "common land" for posterity will be assured. The land size of the public school site, its degree of development, and its natural and manmade amenities will contribute significantly to the formation of attitudes of citizens. The future of public education will be influenced by these attitudes.

Concluding Remarks

School officials are responsible for policy formation and implementation in public school districts. Accordingly, the following economic recommendations are offered for governing boards of education and school personnel as they develop policy concerning school sites.

1. The sites on which schools are located are fully as important to the educational process as school buildings; each school site shall have educational specifications developed for it in the same way that educational specifications are developed for school buildings.

2. The selection of future school sites and the acreage expansion of small, undeveloped school sites shall be a cooperative effort of boards of education, local and regional planning agencies, related governmental departments and services, and interested community organizations in order that master land use plans can be developed in a sound and comprehensive manner.

3. School sites shall no longer be developed in traditional patterns; but, instead in the

future the land and its natural features should be respected and evaluated by multidisciplinary resource personnel so that the key components of master plans take full advantage of the existing natural assets.

4. The board of education shall allocate sufficient public tax revenues for enhancing the use and development of school sites, always putting the first priority on naturalness and respect for the land.

5. The board of education shall initiate and establish a permanent record of the inventory of resources of each school site in order to formulate sound fiscal decisions relating to school site development. The inventory shall include the following components:

   a. Topography - slope, drainage
   b. Soil - character, type
   c. Vegetation - type and quality
   d. Zoological Significance
   e. Geological Characteristics
   f. Structures - type, quality, historical reference
   g. Natural Vehicular Patterns
   h. Natural Pedestrian Patterns
   i. Climatology
   j. Ecological Significance
   k. Orientation
   l. Unique Environmental Qualities
   m. Curriculum Inferences
   n. Water Type and Quality
   o. Natural Features

6. The board of education shall prepare a series of related school site plans to insure the maximum economic benefit from site development.

   a. Resources Inventory Site Plan
   b. Site Development Plan
   c. On-Site Technical Assistance Plan
   d. Follow-up Assistance Plan
   e. Comprehensive Master Plan

7. The board of education shall provide sufficient public tax revenues and personnel for the implementation of the plan upon the completion of the Comprehensive Master Plan for school sites.

8. School site design and development shall be entrusted to those who are competent in this field, the professional landscape architect or professional site design consultant, just as the economic aspects of building design and construction are entrusted to competent professional architects.

9. The board of education shall continue annual review of the economic market conditions for surrounding residential real estate after the initial establishment of a new school site and building. The review shall be based upon:

   a. Economic data collection of market sale prices and property tax revenue yields of housing surrounding the school site.

   b. Economic data collection and visual inspection of the physical life span of housing surrounding the school site.

   c. Economic data collection of new residential buildings, home improvements, density of population within the service area, building permits issued, and related market data items.

10. The board of education shall develop well-defined school site policies based upon realistic economic concepts and real economic data analyses for sites and surrounding residential housing.

11. The board of education shall formulate permanent school-park commissions to utilize, develop, plan and maintain school-park complexes within communities.

12. The board of education shall conduct economic feasibility studies of its small, undeveloped school sites to determine the fiscal investment of site expansion, the cost of site maintenance, the cost of site development based upon a master plan in order to insure the fiscal stability of surrounding residential housing and to increase the potential tax revenue from real property.

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SCHOOL SITE DECISIONS AND DOLLARS

The Establishment of Outdoor Classrooms
On School Sites as Public Policy

Michigan General School Law

(254) § 340.365 Humane treatment and protection of animals and birds, economy of nature.

§ 365. In every public school within this state, a portion of the time shall be devoted to teaching the pupils thereof kindness and justice to, and humane treatment and protection of, animals and birds, and the important part they fulfill in the economy of nature. It shall be optional with each teacher whether such teaching shall be through reading, stories, narratives of daily incidents or illustrations taken from personal experience. This instruction shall be a part of the curriculum of study in all public schools of the state of Michigan.

Dr. Karl W. Grube

Lecturer, School of Education,
Eastern Michigan University,
Ypsilanti, Michigan 48197

and
Lecturer, School of Education,
The University of Michigan,
Ann Arbor, Michigan 48104

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Public school programs often provide the only opportunity for many young citizens to understand their dependency on natural resources and man's relationship to the beneficial use of the natural environment. Knowledge and understanding certainly occurs through the channels of books, discussions and formal teaching, but the environmental opportunities for learning can best be discovered through direct experience with the natural environment--the land area of the public school site.

As a fundamental land component of the school site, the outdoor classroom expands the traditional learning experiences of the formal classroom to a new learning center which is readily accessible to youth and teachers. Environmental learning on school sites requires no special permits,

no time-consuming arrangements for transportation, and no altering of class schedules. Accordingly, the outdoor classroom is readily available for continuous learning, for unexpected observation, for supervised learning projects, and for capitalizing on the "teachable moment."

Basically attitudes guide behavior which are usually shaped early in life. In an outdoor classroom learning environment, youth can have the many sensory and related learning experiences with natural resources, i.e., soil, water, plants, animals, needed to develop a personal value system which gives priority to behavior consistent with rational and prudent use of these resources. As a result of directly working with natural resources, young people learn an appreciation for the inter-relationships of living things and how their decisions and behavior affect all living things. More important, they learn how people are affected by the way they use soil, water, air, and other living resources.

IMPLICATIONS OF SCHOOL SITE DEVELOPMENT

PAST HISTORY

Historically, most school systems have given little or no consideration to ways in which the school site can be used to enhance the educational process. For this reason many of the educational features of school sites are lost

during the construction stage. The site is leveled, natural vegetation is stripped from the land, and natural water courses are altered and put under asphalt. This approach to school site development results in reduction of the "educational potential" of the site and degradation of its aesthetic appeal. If we are to alter this trend of disregard for the environment, a concerted effort must be made to plan for, to develop, and to maintain outdoor classrooms on school sites.

SITE SELECTION - EDUCATIONAL POTENTIAL

School sites can and should be used to enhance the instructional program of the school. One of the most important criteria in school site selection should be the educational potential of the site. When the existing natural features and natural processes of the school site land are first respected and allowed to remain in a preserved state, then the educational potential of the site is greatly enhanced. Accordingly, outdoor classrooms which are developed and designed with the site's natural amenities as a first priority can play a significant role in helping youth and adults to increase their interest, understanding, and respect for man's environment.

THE VALUE OF A COMMUNITY SCHOOL SITE

Our communities provide few public opportunities for youth to improve their biosphere. School sites can offer many opportunities for youth to plan for, to develop, and to maintain outdoor classrooms on school sites. It is through activities of this nature that youth develop important attitudes about man's relationship to his environment.

A well-designed and developed school site serves the community in numerous ways. After school and summer programs can be established to enable individuals, families, and youth groups to capitalize on available recreation and learning opportunities. Many city recreation departments frequently hire a naturalist to conduct informal and formal environmental education programs on school sites having outdoor classrooms. Opportunities of this nature should be available for youth throughout the community.

A PLANNING PROCESS - INVOLVEMENT

In planning an outdoor classroom on a school site, a committee composed of a school board member, a school administrator, a soil conservationist, teachers representing various areas of the curriculum, students of different age levels, and interested community members should be established to develop educational specifications for the site and the outdoor classroom area. A school site committee will not only generate a larger number of creative ideas,

but will also enhance the use of the site, tend to discourage vandalism, and perpetuate the value of the site to the community.

THE ECONOMIC IMPACT OF SITE DEVELOPMENT

School site development can be justified economically. As the quality and educational potential of a school site is improved, the surrounding property value of residential homes is increased. Increased property tax value is reflected by an increase in the tax revenue collection from neighboring lands; therefore, every time a school millage issue is passed, the school will receive additional funds as a direct result of the impact of the site development.

ENVIRONMENTAL PROBLEMS - GUIDELINES FOR ACTION

There is a great need for us to develop a systematic approach to the environmental problems which we face today and will increasingly confront in the future. That solution will come only if we can make citizens aware of the importance of natural resources and how each action is related to and is built upon those natural processes. Further, citizens must be given a feeling of confidence that they can be influential in decision-making on realistic environmental improvement programs.

In developing an environmental education program on school sites to provide the necessary experiences and knowledge, certain social and scientific understandings must be presented. Some of these concepts may best be presented in the classroom, but others may be more effectively taught beyond the four walls of the school building. It is important that we inculcate in our youth a greater interest, awareness, understanding, and respect for our environment. In this regard, we should continue to teach indoors that which can best be learned there, and teach in the outdoors that which can be best learned in that environment.

A MASTER PLAN FOR ENVIRONMENTAL EDUCATION

In January of 1973, the state of Michigan officially adopted a master plan for environmental education. The plan, Michigan's Environmental Future: A Master Plan For Environmental Education, provides "the framework, guidelines, and processes for coordinating and evaluating all environmental communications, education, and information activities in Michigan."

Of significance for school officials is Recommendation 35 for elementary and secondary education. It reads: "That each school system design an environmental education plan that develops and uses every existing and projected school site to improve learning opportunities." These

learning opportunities for K-12 pupils can best be accomplished through the design, development, and implementation of an outdoor classroom on the school site.

Accordingly, the following outdoor classroom public school site policy is offered to school officials for adoption and as a model for implementing Recommendation 35 of the state master plan for environmental education for elementary and secondary education.

OUTDOOR CLASSROOM SITE POLICY: A SUGGESTED MODEL

RECOMMENDED POLICY STATEMENT:

It shall be the policy of this governing board of education that:

(1) The sites on which schools are located are fully as important to the educational process as school buildings; each site should have educational specifications developed for it in the same way that educational specifications are developed for school buildings.

(2) The outdoor classroom is recognized as fully important to the educational process as other curricula; each outdoor classroom should have educational specifications developed for it in the same way that educational specifications are developed for other curricula.

(3) This land, the outdoor classroom, shall not be developed in the traditional sense, but rather its existing natural features and natural processes shall be first respected and evaluated by interdisciplinary resource personnel, i.e., biologists, naturalists, landscape architects, soil conservationists, teachers, administrators, urban planners, interested community members.

(4) The policy-making agency (board of education) shall allocate sufficient monies public and private, for

enhancing the use of this outdoor classroom, always keeping in mind the first priorities of naturalness and respect for natural processes that preceded man's use of this land.

(5) The board of education shall initiate and establish a permanent resource inventory record of each school site consisting of the following site components.

A. Topography - slope, drainage
B. Soil - character, type
C. Vegetation - type, quality
D. Zoological Significance - birds, animals
E. Geological Characteristics
F. Structures - type, quality, historical reference
G. Natural Vehicular Patterns - ingress, egress
H. Ecological Significance
I. Natural Pedestrian Patterns
J. Orientation
K. Climatology
L. Unique Environmental Qualities
M. Curriculum Inferences
N. Water - type, quality
O. Natural Features

(6) After the initial establishment of the outdoor classroom, continued annual review should occur based upon:

A. Records of use of the Outdoor Classroom during the previous year.
B. Presentation of the educational use plan for the ensuing year.

(7) During the design and construction of the outdoor classroom the builders shall be admonished and required to control pollution of air, water, soils and natural resources of the land as precluded by local, state, and national statutes. This shall be accomplished under the supervision of professional personnel.

(8) It is the intent of this board of education not only to adhere to the following guidelines for an outdoor classroom design and development of new school sites, but also to bring present campuses up to those specifications at least to the extent to which the site is adaptable, within a reasonable time, and to continually maintain all sites and outdoor classrooms within the school district in accordance with those guidelines.

(9) To this end, the board of education shall initiate and prepare over the next three years to bring present campuses up to outdoor classroom specifications as

related to the following site plans.

A. Resource Inventory Site Plan
B. Site Development Plan
C. On-Site Technical Assistance Plan
D. Follow-up Assistance Plan
E. Comprehensive Master Plan

(10) Upon the completion of the Comprehensive Master Plan for the outdoor classroom, the board of education shall provide sufficient monies, public or private, and personnel for the implementation of the plan.

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